

AMENDMENTS TO THE SPECIFICATION:

Page 1, please add the following new paragraphs before paragraph [0001]:

[0000.2] CROSS-REFERENCE TO RELATED APPLICATIONS

[0000.4] This application is a 35 USC 371 application of PCT/DE 2004/001520
filed on July 13, 2004.

[0000.6] BACKGROUND OF THE INVENTION

Please replace paragraph [0003] with the following amended paragraph:

[0003] ~~Background of the Invention~~ **Description of the Prior Art**

Please replace paragraph [0004] with the following amended paragraph:

[0004] ~~Injectors~~ **Known injectors** controlled with a piezoelectric actuator have very much shorter switching times than injectors that are controlled with a magnet valve or electrohydraulically. If the function of the piezoelectric actuator is to be assured over the entire rpm range, the piezoelectrically controlled injectors require a return counterpressure of approximately 10 bar in the region of their hydraulic coupler. The return counterpressure is attained by equipping fuel injection systems, already equipped with piezoelectrically controlled injectors, with a low-pressure reservoir. The low-pressure reservoir is closed off by a pressure holding valve, which in the direction from the injector to the tank acts as an overflow valve. In this way, in operation of the engine, the return flow quantity from the injectors is dammed up to a defined return pressure of approximately 10 bar.

Page 2, please replace paragraph [0007] with the following amended paragraph:

[0007] ~~Summary of the Invention~~ **SUMMARY OF THE INVENTION**

Page 4, please replace paragraph [0015] with the following amended paragraph:

[0015] ~~Drawing~~ **BRIEF DESCRIPTION OF THE DRAWINGS**

Please replace paragraph [0016] with the following amended paragraph:

[0016] The invention is described in further detail below, in conjunction with ~~a drawing. Shown~~
are the drawings, in which:

Please delete paragraph [0017].

Please replace paragraph [0018] with the following amended paragraph:

[0018] Fig. 1[[,]] **is a schematic illustration of** a fuel injection system of the prior art with an electric low-pressure prefeed pump;

Please replace paragraph [0019] with the following amended paragraph:

[0019] Fig. 2[[,]] **is a view similar to Fig. 1 showing** a fuel injection system embodied according to the invention, with an overflow valve; **and**

Please replace paragraph [0020] with the following amended paragraph:

[0020] Fig. 3[[,]] **is a sectional view, on an enlarged scale, of** an overflow valve embodied according to the invention.

Please replace paragraph [0021] with the following amended paragraph:

[0021] ~~Variant Embodiments~~ **DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Please delete paragraph [0022].

Page 5, please replace paragraph [0023] with the following amended paragraph:

[0023] ~~In a fuel injection system-~~ **Fig. 1 shows a fuel injection system according to the prior art, with an electric low-pressure prefeed pump** for supplying **fuel to** a self-igniting internal combustion engine[[,]] **in which** fuel from a fuel container, not shown, is delivered via a fuel supply line 1 to a prefeed pump 2. In the prefeed pump 2, the fuel is precompressed, and it is delivered onward via a low-pressure line 3 to a high-pressure pump 4, in which the fuel is compressed to the pressure of a high-pressure reservoir 5 and then delivered to that reservoir. The pressure in the high-pressure reservoir 5 that is required for engine operation is in the range of from 100 to 2000 bar. From the high-pressure reservoir 5, the fuel is delivered via high-

pressure supply lines 6 to injectors 7. Instead of the fuel injection system shown in Fig. 1 with six injectors, with which a six-cylinder engine is associated, the fuel injection system may also include any other number of injectors.

Please replace paragraph [0025] with the following amended paragraph:

[0025] A constant pressure in the low-pressure reservoir 9 is attained by providing that the low-pressure reservoir 9 is closed [[off]] by a pressure holding valve 11. When the opening pressure of the pressure holding valve 11 is exceeded, the pressure holding valve 11 opens, and fuel flows via a low-pressure return [[to]] 13 back into the low-pressure line 3. As soon as enough fuel has flowed out of the low-pressure reservoir 9 that the pressure is again below the opening pressure of the pressure holding valve 11, the pressure holding valve 11 closes again.

Page 6, please replace paragraph [0027] with the following amended paragraph:

[0027] Fig. 2 shows a fuel injection system embodied according to the invention, with an overflow valve. Unlike Fig. 1, in the fuel injection system embodied according to the invention, there is no prefeed pump 2 between the fuel container and the high-pressure pump 4. In the fuel injection system embodied according to the invention, the fuel is pumped directly from the fuel container into the high-pressure reservoir 5 via the fuel supply line 1 and a high-pressure line 32 by means of the high-pressure pump 4. Typically, a mechanically driven prefeed pump 2 is integrated with the high-pressure pump 4 in such systems, as a result of which the region downstream of the prefeed pump 2 is no longer accessible from outside. Via the high-pressure supply line 6, the injectors 7 are supplied with fuel from the high-pressure reservoir 5. The fuel required for hydraulic operation of the injectors 7 that is not injected into the combustion chambers of the engine is returned to the low-pressure reservoir 9 via the injector return lines 8. The low-pressure reservoir 9 is closed with the pressure holding valve 11. As soon as the pressure in the low-pressure

reservoir 9 exceeds the opening pressure of the pressure holding valve 11, the pressure holding valve 11 opens, and fuel flows back into the fuel container via the return line 12.

Please delete paragraph [0028].

Please replace paragraph [0029] with the following amended paragraph:

[0029] For filling the low-pressure reservoir before the engine is started, an overflow line 33 branches off from the high-pressure line 32 downstream of the high-pressure pump 4. The overflow line 33 communicates with the low-pressure reservoir 9 via an overflow valve 15 and a low-pressure connection 34. The attachment of the overflow valve 15 to the overflow line 33 may be done for instance by means of a high-pressure connector 17 with a fitting union nut 19. The communication of the overflow valve 15 with the low-pressure connection 34 is effected via a low-pressure connector 25. Fuel that occurs because of an incident leak fuel flow is collected in a low-pressure chamber 28 and is returned to the fuel container via a leak fuel line 35, which communicates with the return line 12. The leak fuel line 35 is secured to the overflow valve 15 by a return connector 26. Since the lines on the low-pressure side of the fuel injection system are typically embodied as plastic hoses with integrated woven fabric, the return connector 26 and the low-pressure connector 25 are embodied as connection nipples for hoses.

Page 8, please delete paragraph [0031].

Please replace paragraph [0032] with the following amended paragraph:

[0032] As best seen in Fig. 3, the overflow valve 15 includes a valve housing 18, a valve piston 21, and a valve spring 24. A pressure face 22 and a seat face 36 diametrically opposite the pressure face 22 are embodied on the valve piston 21. The seat face 36 together with the valve housing 18 forms a valve seat 23. In the position of the valve piston 21 shown in Fig. 3, the overflow valve 15 is open. The pressure face 22 of the valve piston 21 points in the direction of a high-pressure connection 16. The high-pressure connection 16 includes the high-pressure connector 17, which preferably closes the overflow line 33. The high-pressure

connector 17 is secured to the valve housing 18 by means of the union nut 19. The valve piston 21 is acted upon by the valve spring 24 with a spring force F. The spring force F is dimensioned such that the overflow valve 15 closes when a defined pressure in the high-pressure connection 16 is reached. The force acting on the pressure face 22 of the valve piston 21 can be calculated in accordance with the equation

$$F = p \cdot \frac{\pi}{4} \cdot d^2$$

where p = the pressure in the return and d = the diameter of the pressure face 22.

Page 9, please replace paragraph [0034] with the following amended paragraph:

[0034] The valve spring 24 employed for opening the valve rests on a spring bearing face 29 on the valve piston 21 and on a spring chamber boundary wall 30 on the valve housing 18. For receiving the valve spring 24, a spring chamber 31 is ~~received~~ **formed** in the valve housing 18. A bore is also made in the valve housing 18, preferably centered relative to the spring chamber 31. The bore acts as a valve guide 27 and forms a low-pressure chamber 28 downstream of the valve piston 21. The diameter d of the valve guide 27 [[d]] is selected such that the valve piston 21 is guided with little play. For filling of the low-pressure reservoir 9, fuel flows via the high-pressure connection 16 around the valve piston, with the seat face 36 that here is embodied conically, into the spring chamber 31. From there, via the low-pressure connector 25, the fuel

leaves the overflow valve 15 in the direction of the low-pressure reservoir 9. Some of the fuel flows along the valve guide 27 into the low-pressure chamber 28. The fuel that flows along the valve guide 27 simultaneously serves to lubricate the valve piston 21 in the valve housing 18. Since the low-pressure chamber 28 is in direct communication with the fuel container, approximately the same pressure prevails in the low-pressure chamber as in the fuel container. Because of the difference in pressure between the spring chamber 31 and the low-pressure chamber 28, replenishing fuel always flows into the low-pressure chamber 28. The fuel from the low-pressure chamber 28 is carried back into the fuel container via the return connector 26.

Page 10, please replace paragraph [0036] with the following amended paragraph:

[0036] Besides the conically embodied seat face 36 shown in Fig. 3, the valve seat may instead be embodied as a ball seat, flat seat, or slide, or any other form known to one skilled in the art. For instance, any two-way valve, which closes the communication from the overflow line [[13]] **33** into the low-pressure reservoir 9 at a predetermined closing pressure is suitable as the overflow valve 15.

Please add the following new paragraph after paragraph [0036]:

[0037] The foregoing relates to preferred exemplary embodiments of the invention, it being understood that other variants and embodiments thereof are possible within the spirit and scope of the invention, the latter being defined by the appended claims.

Please delete pages 11 and 12.